

8.0 CONCLUSIONS

The analysis in the preceding sections of this biological opinion forms the basis for conclusions as to whether the proposed action, the ongoing operation of the FCRPS, and the BOR projects identified in Table 1.0-1 satisfy the standards of ESA Section 7(a)(2). To do so, the Action Agencies must ensure that their proposed action is not likely to jeopardize the continued existence of any listed species or destroy or adversely modify the designated critical habitat of such species. Section 4 of this opinion defines the biological requirements and the current status of each of the 12 listed salmonid species. Section 5 evaluates the relevance of the environmental baseline to each species' current status. Section 6 details the likely effects of the proposed action, both on individuals of the species in the action area and on the listed population as a whole, across its range and life cycle. Section 7 considers the cumulative effects of relevant non-Federal actions reasonably certain to occur within the action area. On the basis of this information and analysis, NMFS draws its conclusions about the effects of the FCRPS and the BOR projects on the survival and recovery of the 12 listed salmonid species.

As discussed in Section 1.3 of this biological opinion, NMFS must now determine "whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the environmental baseline and cumulative effects, and considering measures for survival and recovery specific to other life stages." The information available to NMFS for this determination is both quantitative and qualitative. For some species, such as SR spring/summer chinook salmon, the available information includes substantial quantitative data based on empirical observations. For other species, such as SR sockeye salmon, the available information is largely qualitative, based on the best professional judgment of knowledgeable scientists. Despite an increasing trend toward a more quantitative understanding of the critical life signs for these fish, critical uncertainties limit NMFS' ability to project future conditions and effects. As a result, no hard and fast numerical indices are available for any of these stocks on which NMFS can base determinations about jeopardy or the adverse modification of critical habitat (the Section 7(a)(2) standards). Ultimately, for all 12 ESUs, NMFS' conclusions are qualitative judgments based on the best quantitative and qualitative information available for each species.

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8.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

8.1.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this stream-type salmonid, which migrates to the ocean as a yearling and spawns and rears in tributaries upstream of the FCRPS, are not being met, either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of this species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with current prospects for survival and recovery across the range and life cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include substantial ongoing juvenile and adult mortality associated with dam and reservoir passage and high TDG levels during periods of involuntary spill. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

At the species level, Table 6.3-12 indicates that at least 2%, and up to 33%, survival improvements are needed for 80% of index stocks to meet the indicator criteria. Substantial survival improvements, in addition to those likely to result from the proposed action and other measures for survival and recovery that affect other life stages, are required to ensure a high likelihood of survival and a moderate-to-high likelihood of recovery for the other spawning aggregates within this ESU. Some portion of additional survival improvement may result from ongoing Federal conservation efforts to improve habitat and hatchery practices identified in the basinwide strategy. The degree to which these Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of SR spring/summer chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.1.2 NMFS' Issuance of Section 10 Transportation Permit

After reviewing the current status of SR spring/summer chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action (particularly those described in Sections 6.2.3 and 6.2.8), and cumulative effects, NMFS concludes that the issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.2 SNAKE RIVER FALL CHINOOK SALMON

8.2.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this ocean-type salmonid, which outmigrates as a subyearling and both spawns and rears in the action area, are not met either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of the species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with current prospects for survival and recovery across the range and life cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include substantial ongoing juvenile and adult mortality associated with dam and reservoir passage, and high TDG levels during periods of involuntary spill. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

At the species level, Table 6.3-12 indicates that substantial survival improvements (6% to 64%), in addition to those likely to result from the proposed action and other measures for survival and recovery that affect other life stages are required to ensure a high likelihood of survival and a moderate-to-high likelihood of recovery for this ESU. Some portion of additional survival improvement may result from ongoing Federal conservation efforts to improve habitat and hatchery practices identified in the basinwide strategy. The degree to which Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of SR fall chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.2.2 NMFS' Issuance of Section 10 Transportation Permit

After reviewing the current status of SR fall chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action (particularly those described in Sections 6.2.3 and 6.2.8), and cumulative effects, NMFS concludes that issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.3 UPPER COLUMBIA RIVER SPRING CHINOOK SALMON

8.3.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this stream-type salmonid, which outmigrates as a yearling and both spawns and rears in tributaries upstream of the FCRPS, are not being met either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of this species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with current prospects for survival and recovery across the range and life cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

The key effects on this species in the action area are summarized in Section 6.2.9. The effects include juvenile and adult mortality associated with dam and reservoir passage, and high TDG levels during involuntary spill. Juvenile and adult mortality in the action area is still substantial. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

At the species level, Table 6.3-12 indicates that substantial survival improvements (at least 45%), in addition to those likely to result from the proposed action and other measures for survival and recovery that affect other life stages, are required to ensure a high likelihood of survival and a moderate-to-high likelihood of recovery for this ESU. Some portion of additional survival improvement may result from ongoing Federal conservation efforts to improve habitat and hatchery practices, identified in the basinwide strategy. The degree to which these Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of UCR spring chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.3.2 NMFS' Issuance of Section 10 Transportation Permit

Only a small part of this population is affected by summer transportation from McNary Dam. After reviewing the current status of UCR spring chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.4 UPPER WILLAMETTE RIVER CHINOOK SALMON

8.4.1 Proposed BPA, Corps, and BOR Action

Salmonids in this ESU spawn and rear in tributaries that enter the Columbia River downstream of all FCRPS dams. The only effects of FCRPS operation on this ESU are potential degradations of habitat in the estuary and plume. The extent of these effects is uncertain and appears to be minor, compared with other factors influencing the status of this species (Table 6.3-13). After reviewing the current status of UWR chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.4.2 NMFS' Issuance of Section 10 Transportation Permit

UWR chinook salmon will not be affected by issuance of a Section 10 permit.

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8.5 LOWER COLUMBIA RIVER CHINOOK SALMON

8.5.1 Proposed BPA, Corps, and BOR Action

As discussed in Section 6.2, this ESU is distributed primarily in spawning and rearing areas below Bonneville Dam. Within the action area, the key effects on this species are summarized in Section 6.2.9. Effects of the FCRPS include passage mortality of juveniles and adults through one dam and reservoir for a limited number of subbasin populations. For the small portion of the ESU that spawns in the Ives Island area below Bonneville Dam, access to, and quantity and quality of, that spawning habitat can be affected by FCRPS flow regulation. At the species level, however, this ESU has multiple populations within the Columbia River basin, most of which are below FCRPS projects.

Per USFWS and NMFS' implementing regulations, adverse effects on constituent elements of critical habitat generally do not result in a determination of "adverse modification" unless that loss, when added to the environmental baseline, is likely to appreciably diminish the value of that critical habitat for both the survival and recovery of the listed species (50 CFR Sec. 402.02). As discussed in Section 4.1.5 and Appendix C, the principal factors for decline and existing bottlenecks to recovery of LCR chinook salmon are as follows:

- A pervasive influence of hatchery fish on most natural populations, including both spring- and fall-run populations
- Timber harvesting and associated road building, agriculture, and urbanization that have affected riparian vegetation, stream hydrology, and water quality in tributary spawning areas
- Access to substantial spawning habitat that has been blocked (or passage is substantially impaired) in the Cowlitz (Mayfield Dam), Lewis (Merwin Dam), Clackamas (North Fork Dam), Hood (Powerdale Dam), and Sandy (Marmot and Bull Run River dams) rivers

Given this context, NMFS must determine whether mainstem spawning habitat is an essential requirement of LCR chinook salmon. Because tule chinook salmon have been observed spawning in the Ives Island complex only once (October 1999), the answer to this question depends on whether mainstem spawning was, historically, a significant characteristic of the ESU and, if so, whether mainstem spawners made up independent populations (or, whether they were closely associated with populations in the lower ends of adjacent tributaries). The Willamette/Lower Columbia River Technical Recovery Team will consider these issues. However, at the present time, NMFS knows of no evidence that mainstem spawning was, historically, a significant characteristic of the ESU.

After reviewing the current status of LCR chinook salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, NMFS concludes that the proposed action is not likely to jeopardize the continued

existence of LCR chinook salmon or to destroy or adversely modify its designated critical habitat.

8.5.2 NMFS' Issuance of Section 10 Transportation Permit

LCR chinook salmon will not be affected by issuance of a Section 10 permit.

8.6 SNAKE RIVER STEELHEAD

8.6.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this stream-type salmonid, which migrates to the ocean as a yearling and spawns and rears in tributaries upstream of the FCRPS, are not being met, either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of this species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with current prospects for survival and recovery across the range and life cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include substantial ongoing juvenile and adult mortality associated with dam and reservoir passage, and high TDG levels during periods of involuntary spill. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

At the species level, Table 6.3-12 indicates that substantial survival improvements (at least 56%), in addition to those likely to result from the proposed action and other measures for survival and recovery that affect other life stages, are required to ensure a high likelihood of survival and a moderate-to-high likelihood of recovery for this ESU. Some portion of additional survival improvement may result from ongoing Federal conservation efforts to improve habitat and hatchery practices identified in the basinwide strategy. The degree to which these Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of SR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.6.2 NMFS' Issuance of Section 10 Transportation Permit

After reviewing the current status of SR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action (particularly as described in Sections 6.2.3 and 6.2.8), and cumulative effects, NMFS concludes that issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify designated critical habitat.

8.7 UPPER COLUMBIA RIVER STEELHEAD

8.7.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this stream-type salmonid, which migrates to the ocean as a yearling and spawns and rears in tributaries upstream of the FCRPS, are not being met, either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of this species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with current prospects for survival and recovery across the range and life cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include substantial ongoing juvenile and adult mortality associated with dam and reservoir passage and high TDG levels during periods of involuntary spill. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

At the species level, Table 6.3-12 indicates that substantial survival improvements (at least 17% to as high as 146%), in addition to those likely to result from the proposed action and other measures for survival and recovery that affect other life stages, are required to ensure a high likelihood of survival and a moderate-to-high likelihood of recovery for this ESU. Some portion of additional survival improvement may result from ongoing Federal conservation efforts to improve habitat and hatchery practices identified in the basinwide strategy. The degree to which these Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of UCR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.7.2 NMFS' Issuance of Section 10 Transportation Permit

Only a small part of this population is affected by summer transportation from McNary Dam. Therefore, after reviewing the current status of UCR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action (particularly as described in Sections 6.2.3 and 6.2.8), and cumulative effects, NMFS concludes that issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.8 MIDDLE COLUMBIA RIVER STEELHEAD

8.8.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this stream-type salmonid, which migrates to the ocean as a yearling and spawns and rears in tributaries upstream of the FCRPS, are not being met, either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of this species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with current prospects for survival and recovery across the range and life cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include substantial ongoing juvenile and adult mortality associated with dam and reservoir passage and high TDG levels during periods of involuntary spill. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

At the species level, Table 6.3-12 indicates that substantial survival improvements (at least 130%), in addition to those likely to result from the proposed action and other measures for survival and recovery that affect other life stages, are required to ensure a high likelihood of survival and a moderate-to-high likelihood of recovery for this ESU. This assessment is based on the similarity of the action's effects on UCR and MCR steelhead and the current status of MCR steelhead, which are at greater risk of extinction than UCR steelhead for the largest population whose risk can be assessed. Some portion of additional survival improvement may result from ongoing Federal conservation efforts to improve habitat and hatchery practices, identified in the basinwide strategy. The degree to which these Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of MCR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.8.2 NMFS' Issuance of Section 10 Transportation Permit

Only a small part of this population is affected by summer transportation from McNary Dam. After reviewing the current status of MCR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action (particularly as described in Sections 6.2.3 and 6.2.8), and cumulative effects, therefore, NMFS concludes that issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.9 UPPER WILLAMETTE RIVER STEELHEAD

8.9.1 Proposed BPA, Corps, and BOR Action

This ESU spawns and rears in tributaries that enter the Columbia River downstream of all FCRPS projects. The only effects of FCRPS operation on this ESU are potential habitat degradations in the estuary and plume. The extent of these effects is uncertain and appears to be minor, compared with other factors influencing the status of this species (Table 6.3-13).

After reviewing the current status of UWR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.9.2 NMFS' Issuance of Section 10 Transportation Permit

UWR chinook salmon will not be affected by issuance of a Section 10 permit.

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8.10 LOWER COLUMBIA RIVER STEELHEAD

8.10.1 Proposed BPA, Corps, and BOR Action

Key effects on this species in the action area, summarized in Section 6.2.9, include passage mortality of juveniles and adults through one dam and reservoir for spawning aggregations in a few subbasins. NMFS' quantitative evaluation of the effects of the proposed action and other ongoing Federal actions on this ESU's species-level biological requirements indicates a slight increase in the median annual population growth rate for summer steelhead in the Clackamas and Kalama subbasins due to recent harvest limitations on A-run steelhead (Table 6.3-10). For most of the spawning aggregations in this ESU, factors other than the FCRPS contributed to their decline and now limit their potential for survival and recovery (Table 6.3-13). After reviewing the current status of LCR steelhead and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.

8.10.2 NMFS' Issuance of Section 10 Transportation Permit

LCR steelhead will not be affected by issuance of a Section 10 permit.

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8.11 COLUMBIA RIVER CHUM SALMON

8.11.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this ocean-type salmonid, which outmigrates as a subyearling and both spawns and rears in tributaries upstream from the FCRPS and in the mainstem Columbia River, are not being met either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, individuals of this species are subjected to adverse effects on spawning and rearing habitat in the Hamilton/Hardy creeks/Ives Island complex below Bonneville Dam that result in their mortality or impaired fitness. Continuing the proposed action for the long term, coupled with the current prospects for survival and recovery across the range and life-cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include adverse effects of flow management on access to Hamilton Creek, Spring Creek, and the Ives Island spawning areas. The quantity and quality of habitat at the Ives Island spawning area are also adversely affected by FCRPS flow management. In contrast to the situation for LCR chinook, this ESU spawns in only two areas, meaning that FCRPS effects on habitat in one of these areas significantly affect the entire ESU. NMFS' quantitative evaluation of the effects of the proposed action and other ongoing Federal actions on this ESU's species-level biological requirements does not indicate any expected change in the median annual population growth rate (Table 6.3-11).

Ongoing Federal conservation efforts to improve habitat and hatchery practices, identified in the basinwide strategy, may improve survival rates. The degree to which these Federal survival and recovery measures will sufficiently improve the ESU's condition is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of CR chum salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.11.2 NMFS' Issuance of Section 10 Transportation Permit

CR chum salmon will not be affected by issuance of a Section 10 permit.

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8.12 SNAKE RIVER SOCKEYE SALMON

8.12.1 Proposed BPA, Corps, and BOR Action

The biological requirements of this stream-type salmonid, which migrates to the ocean as a yearling and spawns and rears in lakes upstream of the FCRPS, are not being met either in the FCRPS action area or at the life-cycle level. As discussed in Section 6.2, when passing through the FCRPS, individuals of this species are subjected to adverse habitat conditions that cause mortality or result in impaired fitness. Although recent improvements in the operation and configuration of the FCRPS have reduced overall mortality rates for the species, current survival through the FCRPS, as affected by operation of the BOR projects, is not sufficient to ensure the survival of the ESU with an adequate potential for recovery. Instead, continuing the proposed action for the long term, coupled with the current prospects for survival and recovery across the range and life-cycle of the ESU, is likely to appreciably reduce the likelihood of both its survival and its recovery.

Key effects of the proposed action on this species in the action area are summarized in Section 6.2.9. They include substantial ongoing juvenile and adult mortality associated with dam and reservoir passage and TDG gas levels during periods of involuntary spill. Although the proposed action describes a process to develop performance standards for actions that would reduce mortality, it is not clear that mortality will be reduced enough or that critical habitat will be adequately protected.

Because the abundance of this ESU is so low, NMFS cannot perform a quantitative assessment of species-level effects of the proposed action and other ongoing Federal actions. However, the ongoing level of risk to this ESU is extremely high and it is likely to remain so if the proposed action continues. The captive breeding program provides short-term protection from extinction, but it is not sufficient to avoid extinction in the future. Some additional improvement in species status may result from ongoing Federal conservation efforts to improve habitat and hatchery practices, described generally in the basinwide strategy. The degree to which these Federal survival and recovery measures will sufficiently augment the survival improvements expected from the proposed action is, however, highly uncertain. NMFS must also rely on progress in implementing non-Federal survival and recovery measures that affect other life stages. Furthermore, NMFS finds that survival improvements beyond those likely to result from the proposed action are reasonably available to the FCRPS Action Agencies. After reviewing the current status of SR sockeye salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action, and cumulative effects, therefore, NMFS concludes that the proposed operation and configuration of the FCRPS and the BOR projects are likely to jeopardize the continued existence of this ESU and to adversely modify its designated critical habitat.

8.12.2 NMFS' Issuance of Section 10 Transportation Permit

After reviewing the current status of SR sockeye salmon and the factors for its decline, the environmental baseline in the action area, the effects of the proposed action (particularly Sections 6.2.3 and 6.2.8), and cumulative effects, NMFS concludes that issuance of a Section 10 transportation permit, as proposed, is not likely to jeopardize the continued existence of this ESU or to destroy or adversely modify its designated critical habitat.